Boston Region Freight Study

A Report of the
Boston Region
Metropolitan
Planning Organization

Boston Region Freight Study

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INTRODUCTION

The purpose of this study is to assemble a primer on freight in the MPO region. The main components of this primer are:

- An inventory of the freight transportation infrastructure and operations in the Boston Region Metropolitan Planning Organization area
- Descriptions of the existing and projected movements of freight in the area
- Lists of freight transportation issues perceived by stakeholders and possibly within the purview of the MPO

This executive summary, after giving some general background on the subject of freight transportation, highlights the study's inventories of infrastructure and operations and of perceived issues. An overview of movements of freight may be found in chapter 2.

BACKGROUND

The ability to efficiently move goods within the region requires suitable infrastructure, operations, and policies. Impediments to movement in any of those spheres can increase the cost of and timeframe for delivery of goods and thus impact the economy.

For the most part, the movement of freight is carried out by the private sector, using both public and private infrastructure. The two major determinants of how any given goods are shipped are transportation cost and travel time. Reliability of on-time arrival is also a factor.

Each freight mode offers advantages and disadvantages in terms of cost, speed, and reliability. Air is the fastest and most reliable and is generally used for the lowest-weight, highest-value, and most time-sensitive cargo. Trucks can move freight quickly and reliably and can carry cargo ranging widely in weight and value. Rail intermodal can be competitive with trucks over the longer distances in terms of both time and money. Rail carload and water transportation are slower and generally used for the highest-weight, lowest-value, and least time-sensitive cargo.

Nationally, the average freight trip lengths by mode are:

Air:	1,070 miles	Water:	511 miles
Rail:	617 miles	Truck:	247 miles

MPO-AREA FREIGHT TRANSPORTATION INFRASTRUCTURE AND OPERATIONS

Freight customers in the MPO area are served by all four freight modes. Generally, goods are distributed in the MPO area over a multimodal network.

Truck

Of the freight transported in Massachusetts, trucks move 94%, and indeed most freight entering the MPO area arrives by truck. Most of this freight travels on the interstate highway system and other roadways directly to its final destination.

Much of the truck freight entering the MPO area comes from the Ports of New York and New Jersey. An alternate mode of freight delivery from the New York/New Jersey area is directly out of those ports by rail to Worcester and Beacon Park Yards in Allston, where it is transferred to truck and distributed in the MPO area.

In addition, a large amount of freight that is delivered to the MPO area enters the United States via the Ports of Los Angeles and Long Beach. After it is unloaded from container ships, it comes east by truck or rail.

Water

Waterborne freight is shipped directly into the Ports of Boston, Salem, and Gloucester, off-loaded, and delivered throughout the MPO region, mainly by truck. If its destination is outside the region, it may either be delivered via truck or be transferred to CSX rail at Beacon Park Yards in Allston or at Worcester. Maritime freight is also trucked to Ayer, Massachusetts, to be transferred for movement by rail on Pan Am. At the present time, there are no operating rail lines providing direct service to the Ports of Boston, Salem, or Gloucester. Rail connections are six miles away for Boston and one mile away for both Salem and Gloucester.

Rail

By rail, freight travels to the MPO area by either the CSX or Pan Am Railways (formerly Guilford Rail System) rail line and is then delivered to its final destination by truck. As mentioned, much freight from the Port of New York/New Jersey travels by rail to Worcester and Beacon Park Yards. In the MPO region, bridge heights prevent the movement of double-stack railcars. Some goods arriving at Logan International Airport and Hanscom Field in Bedford are transferred by truck to CSX or Pan Am Railways for delivery outside the region. Freight movement by rail in the region and linking to other regions is also provided by Bay Colony Railroad in southeastern Massachusetts and Fore River Transportation in Quincy on fixed or dedicated routes.

Air

Freight shipped into the MPO area by air arrives at either Logan International Airport or Hanscom Field in Bedford. It is then transferred to truck either to be shipped to its final destination or to be again transferred to the CSX or Pan Am rail line. Currently, there are no operating rail lines providing service directly to Logan or Hanscom.

ISSUES PERCEIVED BY STAKEHOLDERS AND POSSIBLY IN THE MPO'S PURVIEW[1]

The following descriptions of issues perceived by stakeholders are based on interviews with individuals affiliated with owners and operators of freight transportation facilities and services and with users of freight transportation. The following are are the views of the individuals interviewed.

Truck Freight

- Roadway congestion: Traffic congestion is a major concern; it increases shipping time and makes deliveries unpredictable, diminishing productivity and profitability.
- Safety: Arterial roadway, lane-departure, and rollover crashes are of concern. The trucking industry is promoting improvements to roadway design, safety improvements, and dedicated truck lanes.
- Bridge weight capacity: Closed and weight-restricted bridges sometimes require long detours, resulting in increased shipping costs and reduced efficiency.
- Truck parking: More off-road truck-parking facilities are needed that allow truckers to pull off the road to check their vehicles and/or sleep.
- Tandem trailer storage: There is only one location along the Massachusetts Turnpike (Interstate 90) where tandem trailers can be stored during the times they are not allowed to operate. It is located on the turnpike at Exit 6 near Springfield, Massachusetts. A similar location closer to the MPO region would be beneficial to truck freight operations.
- Dedicated truck lanes on interstate highways: The creation of these lanes would reduce auto/truck crashes, improve safety and travel time, and reduce congestion.
- Improved access to intermodal and roll-on/roll-off shipping facilities: Better roadway access to port and rail facilities would reduce both shipping time and costs.

[1] Issues perceived by stakeholders but outside the MPO's purview are presented in chapter 8.

Waterborne Freight

- "The last mile": Massachusetts's seaports, like most other older seaports, have difficulty moving freight between their facility and major highways. Interposed are districts of local or residential streets.
- Lack of rail service to most port facilities: Freight trains are not currently directly accessing the Port of Boston at Conley Terminal, Moran Terminal, or Charlestown. Direct service to the ports should be provided.
- Overweight-truck routes: There is a need for more overweight-truck routes in the Port of Boston area.
- Dredging: The channel into the Port of Boston is currently dredged to a depth of 40 feet but needs to be at least 45 feet deep in order to accommodate ships of deeper draft, such as those currently servicing the Ports of New York and New Jersey. Massport is pursuing a permit for this dredging.

Rail Freight

- Double-stack: Expanded double-stack capability should be pursued; it is necessary in order for the Port of Boston to be competitive in the future with the "super ports."
- Weight-restricted bridges: A number of rail bridges in the region cannot carry the full 286,000 pounds per train carload. This should be remedied. Also, on a segment of rail line between the Grand Junction and Allston, the ties need upgrading.
- Improving grade crossing safety: Though grade crossing collisions have declined, they are still a concern.

Air Freight

Of the issues related to the air freight industry raised by the stakeholders interviewed, none are believed to be within the MPO's purview.

Non-Mode-Specific

- Four-mode freight centers: The region should have more intermodal freight centers that are accessible to all modes of freight.
- Broader-scoped freight planning: Joint freight planning among contiguous MPOs is desirable.

1 Introduction

The purpose of this study is to assemble a primer on freight in the MPO region. The main components of this primer are:

- An inventory of the freight transportation infrastructure and operations in the Boston Region Metropolitan Planning Organization area
- Descriptions of the existing and projected movements of freight in the area
- Lists of freight transportation issues perceived by stakeholders and possibly within the purview of the MPO

The descriptions of issues perceived by stakeholders are based on interviews with individuals affiliated with owners and operators of freight transportation facilities and services and with users of freight transportation. The individuals who were interviewed and their affiliations are listed in Appendix 1.

This report's organization of the material bulleted above and of additional material is outlined later in this introduction.

BACKGROUND

A key component of a vibrant economy for the Boston Region Metropolitan Planning Organization (MPO) area is the ability to efficiently move goods within the region. That ability requires suitable infrastructure, operations, and policies. Impediments to movement in any of those spheres can increase the cost of delivery of goods and impact the economy.

For the most part, the movement of freight is carried out by the private sector, using both public and private infrastructure. The two major determinants of how any given goods are shipped are transportation cost and travel time. Private freight customers make the choice of which mode—truck, rail, water, or air—is best able to deliver their cargo within their required timeframe for a reasonable price. Reliability of on-time arrival is also a factor.

Each freight mode offers advantages and disadvantages in terms of cost, speed, and reliability. Air is the fastest and most reliable and is generally used for the lowest-weight, highest-value, and most time-sensitive cargo; much cargo that is time-sensitive is so because it is perishable. Trucks can move freight quickly and reliably and can carry cargo ranging widely in weight and value. Rail intermodal can be competitive with trucks over the longer distances in terms of both time and money. Rail carload and water transportation are slower and generally used for the highest-weight, lowest-value, and least time-sensitive cargo.

Nationally, the average freight trip lengths by mode are:

Air:	1,070 miles	Water:	511 miles
Rail:	617 miles	Truck:	247 miles

ORGANIZATION OF THIS REPORT

Chapter 2 gives an overview of primary paths of freight movement to and within the MPO region, of key freight infrastructure, and of current and projected quantities of freight transported. It also lists non-mode-specific issues perceived by stakeholders and possibly within the purview of the MPO.

Chapters 3 through 6 address truck, waterborne, rail, and air freight transportation, respectively. They inventory the infrastructure and operations and list issues perceived by stakeholders and potentially within the purview of the MPO. Information on current and anticipated freight movements and types of freight moved is generally presented in the context of the information on infrastructure and operations. However, in the rail chapter it is also summarized in a brief overview section. Other material provided in chapters 3 through 6 is historical background and information on logistics.

Chapter 7 discusses what other MPOs around the country are doing in freight transportation planning. It also describes federal regulations and programs pertinent to such planning.

Chapter 8 presents issues perceived by stakeholders but lying outside the purview of the MPO.

STUDY METHODS

The primary methods used in this study were stakeholder interviews, document searches, Internet research, and literature reviews. The report itself is a summary of information gathered via these interviews and reviews, supplemented with pertinent data derived from the document searches.

2 Overview of the Region's Freight Movement and Key Facilities; Non-Mode-Specific Issues

The MPO area freight story can be summarized by saying that most goods manufactured outside of the MPO region and delivered to the region come by one of the following methods:

- By truck directly from almost anywhere on the continent to their final destination in the MPO region (or elsewhere in Massachusetts)

- From the Port of New York/New Jersey:
  - By truck to their final destination in the MPO region (or elsewhere in Massachusetts) or
  - By single-stack rail to the Port of Worcester or to Beacon Park Yards in Allston; then transferred to truck for transport directly to their final destination in the MPO region (or elsewhere in Massachusetts)

- By ship to the Port of Boston
  - Delivered by truck to their final destination in the MPO region or elsewhere in Massachusetts (the port has relatively easy access to Interstates 90 and 93 via the South Boston Haul Road) or
  - Delivered by truck to Beacon Park Yards in Allston or to the intermodal facility in Ayer, for intermodal, rail, or truck delivery to their final Massachusetts destination

- From the Port of Los Angeles/Long Beach
  - By double-stack rail to Syracuse, New York, for destacking into single-stack rail cars for delivery to the Port of Worcester or to Beacon Park Yards in Allston; then loaded onto trucks for delivery to their final destination
  - By truck for the entire trip from the Port of Los Angeles/Long Beach

- By air to Logan International Airport, delivered by truck to their final destination in the MPO region (or elsewhere in Massachusetts)

Table 1 shows the amount of freight delivered by highway, water, rail, and air to Massachusetts in 1998 and projected to be delivered in 2010 and 2020. Highway, or truck, is by far the dominant mode. Its current share (arrived at by interpolating between the 1998 and 2010 figures) is approximately 94%.

Figure 1 shows the routes and locations of the major highways and rail lines that connect the intermodal rail and water freight facilities and airports serving the Boston Region

TABLE 1
Massachusetts Freight Movement

	Tons (millions)				Value in Dollars (billions)		
Mode	**1998**	**2010**	**2020**		**1998**	**2010**	**2020**
Air	<1	<1	1		28	66	114
Highway	162	222	268		122	222	355
Rail	14	20	25		8	12	19
Water	14	21	24		2	4	7
Other	8	11	14		1	3	5
State Total	199	274	332		161	307	499
By Destination Market							
Domestic	179	245	293		138	255	403
International	20	30	39		23	53	96

Source: Federal Highway Administration

MPO area. Table 2 lists the commonwealth's busiest intermodal freight facilities and indicates the modes accommodated by them.

NON-MODE-SPECIFIC ISSUES PERCEIVED BY STAKEHOLDERS AND POTENTIALLY IN THE MPO'S PURVIEW

Descriptions of issues perceived by stakeholders were compiled based on interviews with individuals affiliated with owners and operators of freight transportation facilities and services and with users of freight transportation. Perceived issues that are related to truck, water, rail, and air freight transportation and may be of interest to the MPO are presented in the following four chapters, respectively, which address those modes. The non-mode-specific issues perceived by stakeholders and possibly of interest to the MPO are presented below. The following are descriptions of the views of the individuals interviewed (all interviewees for this study are listed in Appendix 1).

Four-Mode Freight Centers

The region should have more intermodal freight centers that are accessible to all four modes of freight. An example of this would be created by providing rail access to the Port of Boston: doing this would make the new intermodal freight centers being constructed in the South Boston Marine Industrial Park practically accessible by water, rail, and truck, with air being connected by a short ride through the Ted Williams Tunnel.

Broader-Scoped Freight Planning

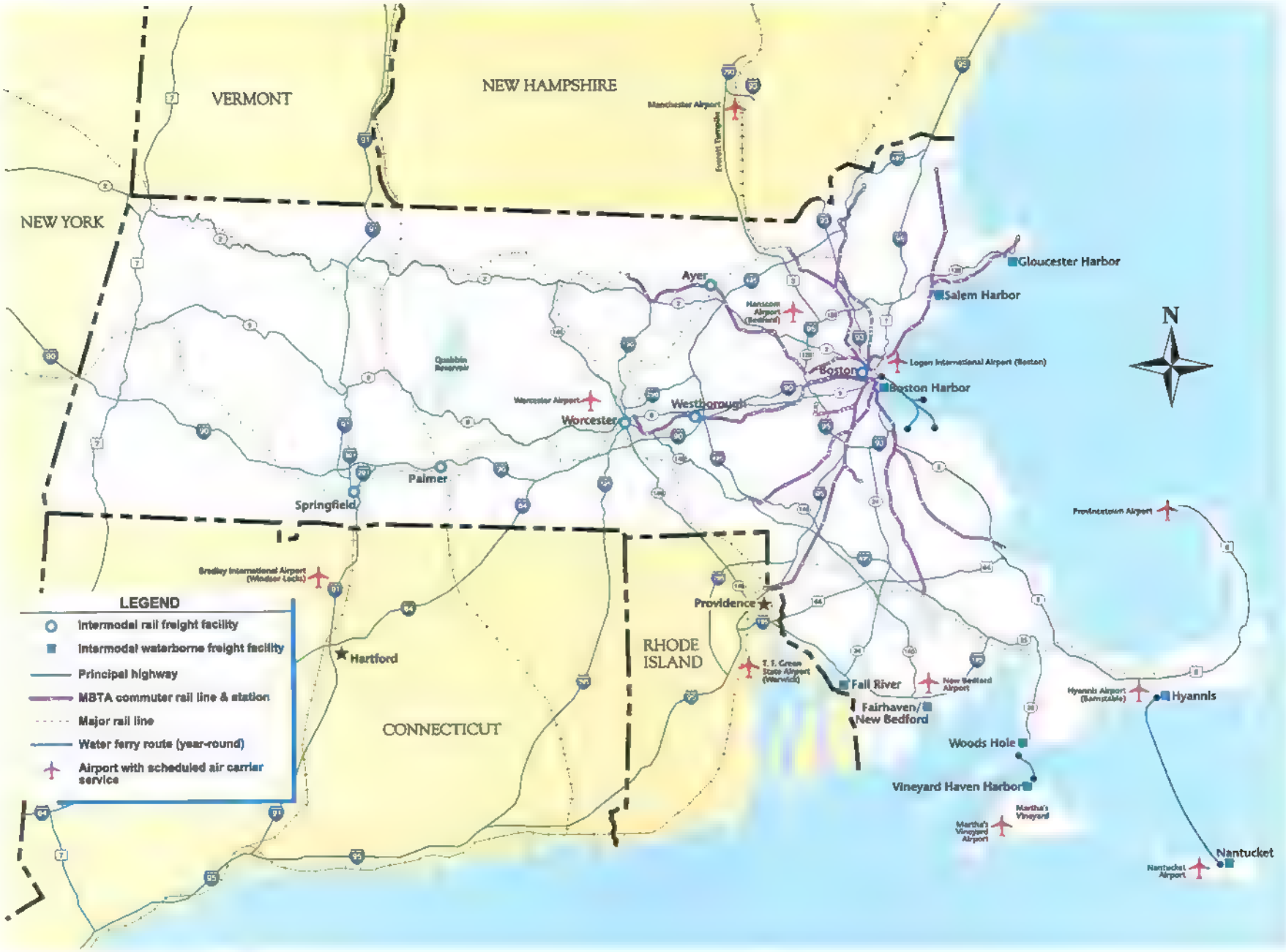
Joint freight planning among contiguous MPOs is desirable.

TABLE 2
Massachusetts Intermodal Freight Facilities

Facility	Modes Accommodated
Massport Conley Terminal	Water / Truck
Boston Autoport	Water / Rail / Truck
New Bedford / Fairhaven Harbor	Water / Truck
Fall River Harbor	Water / Rail / Truck
Salem Harbor	Water / Rail / Truck
Route 1A / Chelsea Creek Petroleum Terminals	Water / Truck
Weymouth Fore River	Water / Truck
Woods Hole MV&N Steamship Terminal	Water / Truck
Hyannis MV&N Steamship Terminal	Water / Truck
Vineyard Haven MV&N Steamship Terminal	Water / Truck
Nantucket MV&N Steamship Terminal	Water / Truck
Worcester Municipal Airport	Air / Truck
New Bedford Municipal Airport	Air / Truck
Barnstable Municipal Airport	Air / Truck
Nantucket Memorial Airport	Air / Truck
Logan International Airport	Air / Truck
Westover Metropolitan Airport	Air / Truck
Barnes Municipal Airport	Air / Truck
Hanscom Field	Air / Truck
Martha's Vineyard Airport	Air / Truck
Worcester P&W Railroad Wiser Avenue Yard	Rail / Truck
Ayer B&M Railroad Auto Yard	Rail / Truck
West Springfield CSX Yard	Rail / Truck
Devens Intermodal Rail Terminal	Rail / Truck
Beacon Park CSX Railroad Yard	Rail / Truck
Worcester P&W Railroad Southbridge Street Yard	Rail / Truck
Worcester TVT CSX Yard	Rail / Truck
Westborough CSX Auto Yard	Rail / Truck
Palmer Intermodal Terminal	Rail / Truck

Source: Massachusetts Office of Transportation Planning

FIGURE 1
Massachusetts Intermodal Freight Facilities



3 Truck Freight

After providing background information on truck freight, this chapter inventories the infrastructure and facilities serving the transport of freight over roadways and records the truck freight issues perceived by stakeholders and possibly within the purview of the MPO.

BACKGROUND

Volumes of Truck Freight

A major portion of the United States economy depends on freight transported by truck. This holds true for the MPO region's economy as well. Trucks make the final delivery of goods to our car dealerships and our corner stores, our home improvement warehouses and our hair salons . . . even to our own doorsteps.

Of all the freight transported in Massachusetts, 93.7% is now carried by truck. Nationally, that percentage is 78%. In 2004, there was over ten billion tons of freight moved by truck in the United States. That number is expected to increase to 13 billion tons by the year 2009. Figure 2 shows the volumes, in tons, of domestic truck-freight traffic in the corridors of travel in the U.S. (In this report, each chapter's *full-page* figures and tables are at the end of the chapter.)

History

The first truck was built in the United States in 1899. Not long after that, the first truck was licensed in Massachusetts. The ongoing improvements in both roads and trucks during the early part of the 20th century gradually freed freight shippers from having to site their facilities near railroads or water. Beginning in the 1950s, the interstate highway system was created, connecting cities with the entire economies of their regions. Manufacturing facilities and residential areas moved farther and farther away from the cities, using the cheap, developable land that had been made accessible by the improved highway network. However, this, in turn, helped to create suburban sprawl, contributing to the congestion that now exists on much of that network.

The long-haul trucker took away a tremendous portion of the business of hauling goods and materials from the railroads, coastal steamers, and river barges. Although the railroads and various marine vessels were able to continue to haul freight to some remaining customers, the truck soon became the only way to serve the newly created suburban customers and the dominant freight mode overall.

Trucking Associations and Businesses

Listed below are some of the major trucking associations to which MPO region trucking firms belong. It is through these organizations that trucking concerns lobby local, state, and federal government concerning highway improvements and other amenities and issues.

- Massachusetts Motor Transportation Association (MMTA)
- Regional Truck Council (RTC)
- American Transportation Research Institute (formerly the American Trucking Research Institute) (ATRI)
- American Trucking Foundation (ATF)
- American Trucking Association (ATA)

There are approximately 260 for-hire trucking companies operating in Massachusetts (compared with, for example, 2,000 trucking companies operating in New Jersey). Approximately 24,000 people are employed in the truck freight transportation industry in the state. With today's competition, congested highways, tough new federal hours-of-service (HOS) rules—made even more stringent in October 2005 (for more details see the truck section of chapter 8)—and employers' use of global positioning systems to keep track of their trucks and truckers, fewer new truck drivers are entering the profession.

Vehicles and Capacities

Trucking companies operate on both a truckload and a less-than-truckload (LTL) basis. A truckload is typically greater than five tons in weight and moved a long distance, typically out of state. LTL trucks carry lesser amounts over shorter distances. The two fundamental types of trucking operations are long-haul, which often use "18-wheelers" with sleeper cabs attached to the back of their tractors, and "local," which may use anything from a tractor-trailer down to a pickup truck. The categories of trucks are depicted in Figure 3, which presents all of the Federal Highway Administration (FHWA) Scheme F Vehicle Classifications.

INFRASTRUCTURE/FACILITIES INVENTORY

Roadways for Truck Freight in the MPO Region and Massachusetts

In the MPO region, there are approximately 23,000 lane-miles of highway. This includes approximately 1,000 miles of interstate highway, 6,000 miles of arterial roads, 2,000 miles of collector roads, and 14,000 miles of local roads.

The major truck routes that go into, out of, and around the MPO region are:

- Interstate 95 – a north–south roadway providing connections to New Hampshire, Maine, and southern states from Rhode Island to Florida; joins with the Route 128 beltway (see below) to bypass Boston

- Interstate 93 – a north–south roadway providing direct access to many regional destinations, including Interstate 95 and Interstate 90
- Interstate 90 (the Massachusetts Turnpike) – an east–west toll road running between the New York State line and Logan International Airport
- Interstate 495 – a beltway bypassing Boston, running through the southern, western, and northern fringes of the region
- Massachusetts State Route 128 – another beltway with a routing similar to that of Interstate 495, but running closer to Boston
- Route 24 – a connection between Route 128 and the southern Massachusetts cities of Fall River and New Bedford

The Ted Williams Tunnel has greatly improved highway connections for the Boston Seaport area. It has reduced the travel time from Logan Airport to the Boston Seaport area to 4½ minutes; previously the time, using the Tobin Bridge, was 45 minutes. The Ted Williams Tunnel, because of its greater vertical clearances, is the only local tunnel that can handle larger tractor-trailer rigs.

Other major state routes in the MPO region are Route 3, Route 3A, Route 1, Route 1A, Route 9, and Route 2. Figure 4 shows all of the major highways in the MPO region, Figure 5 all those in Massachusetts. The functional classification of roadways in the state, down to urban principal arterials and rural minor arterials, is shown in Figure 6.

The ownership, by number of miles, of public roadways in Massachusetts is given in Table 3.

TABLE 3
Public Roadway Ownership and Maintenance Responsibilities

Governmental Entity	Centerline Miles	% of Total
City and town accepted	28,332	88.4%
MassHighway	2,843	8.9%
State Park	275	0.9%
Dept. of Conservation and Recreation	263	0.8%
Mass. Turnpike Authority	143	0.4%
Federal agencies	110	0.3%
Other agencies	70	0.2%
Statewide total	32,036	100%

Source: Massachusetts Highway Department

Massachusetts roadways that are part of the National Highway System (NHS) are shown in Figure 7. The NHS, developed by the U.S. Department of Transportation in conjunction with states, local officials, and MPOs, consists of approximately 160,000 miles of roadway important to the nation's economy, mobility, and defense. The NHS includes interstates; other principal arterials; the Strategic Highway Network (STRAHNET), which comprises the highways providing national defense and emergency response access; the Major Strategic Highway Connectors, which are STRAHNET highways providing access between major military installations; and connectors between intermodal facilities.

The South Boston Bypass Road/Massport Haul Road is a designated truck route that carries heavy industrial truck traffic from local highways to the South Boston Marine Industrial Port and Conley Terminal. This route is a vital connection for industrial uses along the South Boston waterfront. It is the primary connection for freight traffic coming into and out of the Port of Boston.[2]

Overweight-Truck Permits and Routes

Permits

A tractor-trailer (18-wheel) truck is legally allowed to carry up to 80,000 pounds of freight over state highways without a permit. The permits issued in Massachusetts are as follows:

- Reducible Load – For trailer dump trucks, tanker trailers, and other bulk tractor-trailers carrying from 80,001 to 99,000 pounds; good for one year on all roads
- Irreducible Load – For the transport of heavy construction equipment, such as backhoes and bulldozers; weight 99,001 to 130,000 pounds; good for one time only, and only on specific routes
- Super Load – For loads over 130,000 pounds; also good for one time only, and only on specified routes; requires a very involved process to obtain

Applicable federal and state laws covering the above are contained in the Code of Federal Regulations (CFR), Title 23, Part 658.17; Massachusetts General Law (MGL) Chapter 85, Sections 30 and 30A; MGL Chapter 90, Sections 19 and 19A; and Code of Massachusetts Regulations (CMR) 720, Sections 7.00 and 7.14.

In the MPO region, overweight international seaborne shipping containers require special handling, as they may not be opened and inspected at the Port of Boston, because of their

[2]South Boston has long been an industrial employment center. In the 20th century, industry there shifted from iron, glass, brick, wagon, and soap manufacturing to elevator and beer manufacturing. It shifted its shipping modes from railroads and steamships to seaborne containers that relied increasingly on vehicular transportation to move it out of the seaport. Truck routes were designated in South Boston to keep these industrial uses viable. The South Boston Bypass Road is one example of these truck routes.

U.S. Customs seal. Their shipper must provide special trucks and obtain a special permit from MassHighway in order to move them to their final destination.

Routes

Two overweight-truck routes allowing weights up to 99,000 pounds are designated in the Boston area. They were designated primarily for the benefit of the seafood business: going to Gloucester (Route 1A to Route 128) and to New Bedford (Interstate 93 to Route 24). From the Port of Boston area, truckers access them via a route running from Drydock Avenue to the Fargo Street Extension to E Street to Summer Street.

Bridges

There are over 1,500 bridges in the MPO region. Jurisdiction over these bridges and the other bridges in Massachusetts is shown in Table 4, with a breakdown of their physical condition given in Table 5.

TABLE 4
Highway Bridge Jurisdiction
(2004)

Governmental Entity	Number of Bridges	Percent of Total
MassHighway	2883	58%
Cities & Towns	1554	31%
Mass. Turnpike Authority	345	7%
Dept. of Conservation & Recreation	109	2%
Massachusetts Bay Transportation Authority	74	1%
Other Agencies	24	<1%
Statewide Total	4989	100%

Source: Massachusetts Highway Department

MassHighway's statewide Bridge Management System classifies each bridge into one of three categories:

1. Meets standards
2. Functionally obsolete: Fails to meet current traffic demands or highway standards, such as condition, width, or volume
3. Structurally deficient: Load-carrying capacity has been reduced and reconstruction is or may be necessary

TABLE 5
Highway Bridge Condition Ratings

Governmental Entity	Total Bridges	Meeting Standards	Functionally Obsolete	Structurally Deficient
MassHighway	2883	67%	23%	10%
Cities & Towns	1554	61%	23%	16%
Mass. Turnpike Authority	345	66%	29%	5%
Dept. of Conservation & Recreation	109	42%	40%	18%
Massachusetts Bay Transportation Authority	*[Information*	*to*	*be*	*added]*
Other Agencies	24	25%	58%	17%
Statewide Total	4989	63%	25%	12%

Source: Massachusetts Highway Department

Typically, if a bridge is designated either as "functionally obsolete" or as "structurally deficient" due to significant deterioration of the bridge deck, supports, or other major components, it must be "posted." Posted bridges have signs at both ends informing drivers of vehicle weight restrictions, broken out by number of axles. Some posted bridges can be repaired or rehabilitated to meet such standards; others must undergo costly replacement. Very old bridges that cannot be made to carry heavy vehicles may nevertheless be kept for aesthetic reasons or as a community or cultural resource. Currently, there are over 600 structurally deficient bridges in the commonwealth, with over 160 of these in the MPO area.

Posted bridges can have a significant impact on freight traffic and other users. Heavy trucks, emergency vans, school buses, and other heavy vehicles are forced to seek alternate routes. Redirected trips lengthen travel time, use more fuel, and reduce the efficiency of the local economy. Figure 8 is a map of the posted bridges in the MPO region. Appendix 2 contains a list of the 687 bridges that are posted in Massachusetts. Appendix 3 lists the bridges in the Boston region that are scheduled to be reconstructed over the next five years.

ISSUES PERCEIVED BY TRUCK-FREIGHT STAKEHOLDERS AND POSSIBLY IN THE MPO'S PURVIEW

The following descriptions of issues perceived by stakeholders and possibly in the MPO's purview are based on interviews with individuals affiliated with owners and

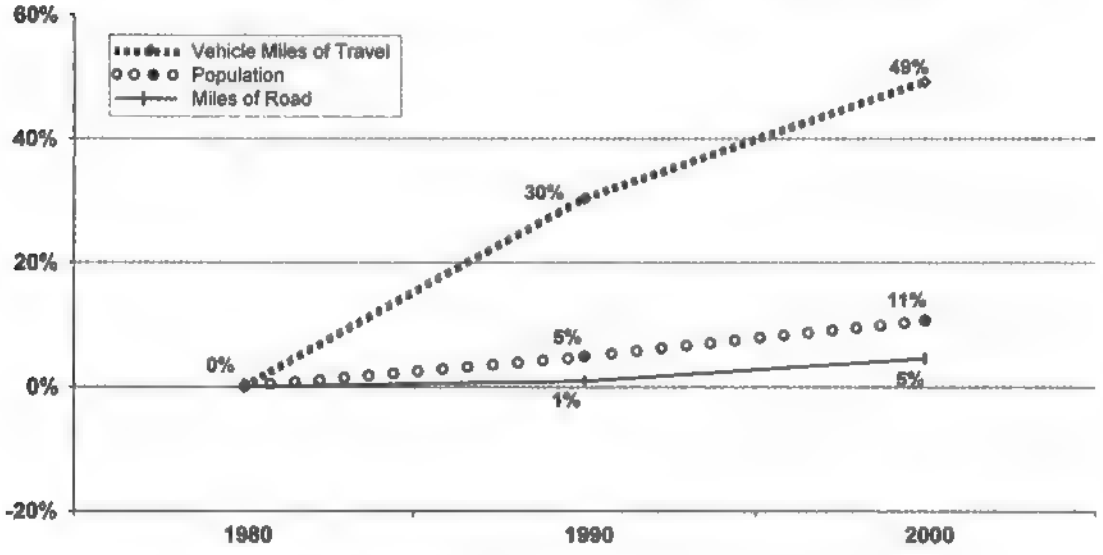
operators of freight transportation facilities and services and with users of freight transportation. Issues perceived by stakeholders but outside the MPO's purview are listed in chapter 8. The following are descriptions of the views of the individuals interviewed (all interviewees for this study are listed in Appendix 1). Some related data are also provided in some cases.

Congestion

Traffic congestion has a major impact on the trucking industry. Especially when it is combined with trucking hours-of-service restrictions, it can seriously diminish productivity and a firm's bottom line. For these reasons, dedicated truck lanes and/or allowing trucks to travel in the high-speed or far-left-hand lanes of highways would be desirable.

Currently, trucks are only allowed in the right-hand or middle lanes. Data on how congestion has grown over time are given in Figures 9 and 10; Figure 11 shows estimated volume-to-capacity ratios on major roads in Massachusetts.

FIGURE 9
Population, VMT, & Roadway Mileage Growth from 1980 to 2000



Source: Massachusetts Highway Department

Safety

Lane-departure crashes, rollover crashes, and safety in general are of concern. Roadway-design improvements, dedicated truck lanes, and other safety improvements are desired. Any reduction in the number of crashes has a corresponding effect on congestion.

The top 60 crash locations for arterial roadways, which include major truck routes in the Boston region, are listed in Table 6.

Figure 12 plots the locations of lane-departure crashes in the MPO region. The Federal Highway Administration (FHWA) defines lane-departure crashes as those in which a vehicle unintentionally departs from its lane and crashes with another vehicle, rolls over, or hits a fixed object. In 2003, these crashes accounted for approximately 60% of the serious injuries and deaths and 40% of all crashes nationwide.

The Federal Motor Carrier Safety Administration (FMCSA), as part of its "Large Truck Crash Causation Study" and its overall goal of reducing the number of large truck crashes, is working with the trucking industry to evaluate Lane Departure Warning Systems (LDWS) for commercial motor vehicles. These systems involve both an on-board component and sensors mounted in the roadway (see Figure 13). Undertaking the installation of an LDWS might be a possible component of both safety and congestion-reduction programs.

A high percentage of the lane-departure crashes in the MPO region are truck rollovers occurring at the Interstate 93/Interstate 95 interchange in Woburn and the Interstate 495/Interstate 290/Route 85 interchange in Marlborough. These two interchanges are included in the MPO's 2004–2025 Regional Transportation Plan for reconstruction and safety improvements in the future.

Bridge Weight Capacity

Closed and weight-restricted bridges cost truckers time and money due to increased fuel consumption, longer delivery times, and other inefficiencies. An example of the problems a closed or weight-restricted bridge causes is the bridge located on Massachusetts State Route 99 in Everett. On this bridge, the reduction in allowable weight from 80,000 pounds, the normal, upper weight limit (no permit required) for tractor-trailer trucks, down to 8,000 pounds requires a detour of 1 to 1½ hours. This can represent a large extra cost for a trucking company. In an example cited, one particular company would incur an extra cost of $13,000 per month (data and calculation method are detailed in Endnote 1).

Truck Parking

The lack of parking facilities for trucks in Massachusetts and the MPO area is a major impediment. More truck parking facilities are needed to allow truckers to pull off the road and check their vehicles for safety, to sleep (in order to comply with hours-of-service regulations), or for other reasons. It is difficult to site these facilities because many people do not want trucks parking near their residences, for a number of reasons, including noise and exhaust from idling trucks. The Massachusetts Motor Transportation Association has proposed using empty commuter rail parking lots during off-peak hours.

Another problem is that there is only one location along the Massachusetts Turnpike (Exit 6 near Springfield) where tandem trailers (double trailers pulled by one truck) can

TABLE 6
Top 60 Crash Locations on Boston Region MPO Area Areterial Roadways, 1999-2001

Rank	City/Town	Roadway		Intersecting Street		Crashes	
		Rte. No.	Street Name	Rte. No.	Street Name	Total No.	Weighted Score
1	Somerville	28	Fellsway		Mystic Avenue	544	1413
2	Medford	16	Mystic Valley Parkway	28	Fellsway	372	936
3	Boston	203	Gallivan Boulevard	3A	Neponset Avenue	343	851
4	Natick	9	Worcester Street		Speen Street	328	612
5	Natick	27	North Main Street	9	Worcester Street	313	593
6	Newton		Centre Street		Washington Street	302	643
7	Wellesley	16	Washington Street	9	Worcester Street	279	563
8	Boston	28	Embankment Road		Charles Circle	258	530
9	Revere	107	Broadway	60	Albert J Brown Circle	239	652
10	Boston		William T Morrissey Boulevard		Freeport Street	236	576
11	Somerville	28	McGrath Highway		Washington Street	222	590
12	Boston		Charlesgate West		Storrow Drive	207	499
13	Concord	2	Reformatory Circle	2A	Lincoln Turnpike	202	350
14	Everett	99	Broadway	99	Sweetser Circle	200	472
15	Boston		Airport Road		Service Road To North Cargo	173	377
16	Natick		Flutie Pass		Speen Street	169	273
17	Cambridge		Garden Street	2A	Massachusetts Avenue	161	337
18	Peabody	114	Andover Street		Prospect Street	159	315
19	Framingham	30	Edgell Road	9	Worcester Road	158	366
20	Natick		Oak Street	9	Worcester Street	153	269
21	Bedford	3	Route 3		Burlington Road	149	365
22	Weymouth	18	Main Street		Middle Street	146	314
23	Reading	28	Main Street		South Street	145	333
24	Boston		Brookline Avenue		Riverway	143	391
25	Cambridge	2A	Massachusetts Avenue	3	Memorial Drive	141	353
26	Boston		Airport Road	1A	East Boston Expressway	139	311
27	Waltham		Lexington Street		Trapelo Road	138	210
28	Newton		Chestnut Street	9	Boylston Street	136	316
29	Quincy		Honorable Thomas S Burgin Parkway		Washington Street	134	330
30	Marlborough	20	East Main Street		Curtis Avenue	134	258
31	Boston		Kosciuszko Circle		William T Morrissey Boulevard	132	328
32	Boston		Cambridge Street		Soldiers Field Road	129	254
33	Framingham	30	Cochituate Road	9	Worcester Road	127	339
34	Framingham	126	Concord Street	135	Waverley Street	127	243

TABLE 6

Top 60 Crash Locations on Boston Region MPO Area Areterial Roadways, 1999-2001

35	Boston		Atlantic Avenue		New Northern Avenue	126	290
36	Boston		North Harvard Street		Soldiers Field Road	126	274
37	Watertown	20	Main Street	16	Mount Auburn Street	126	270
38	Natick	9	Worcester Street		Dean Road	125	277
39	Natick		Speen Street	135	West Central Street	124	245
40	Framingham		Concord Street		Worcester Road	123	291
41	Weymouth		Middle Street	53	Washington Street	123	247
42	Pembroke		Church Street		Route 3	121	273
43	Weymouth	18	Main Street		Pleasant Street	118	250
44	Rockland		Hingham Street		Pilgrims Highway	117	301
45	Somerville		Broadway	28	Mc Grath Highway	116	328
46	Newton		Hammond Pond Parkway	9	Boylston Street	116	288
47	Boston	2	Commonwealth Avenue		Beacon Street	116	241
48	Stoughton		Central Street	138	Washington Street	114	246
49	Wellesley	9	Worcester Street		Weston Road	114	198
50	Quincy		Honorable Thomas S Burgin Parkway		Centre Street	113	285
51	Weymouth	18	Main Street		Winter Street	113	249
52	Cambridge	3	Memorial Drive		River Street	112	236
53	Everett	16	Revere Beach Parkway	16	Santilli Circle	109	301
54	Everett	16	Revere Beach Parkway		Everett Avenue	106	302
55	Braintree		South Shore Plaza		Granite Street	105	249
56	Quincy		Sea Street	3A	Southern Artery	105	193
57	Boston	20	North Beacon Street		Soldiers Field Road	103	271
58	Boston		Birmingham Parkway		Western Avenue	100	260
59	Boston		Storrow Drive	28	David G Mugar Way	99	215
60	Boston	28	Blue Hill Avenue		Columbia Road	98	286

be dropped off. Tandem trailers are not allowed east of Exit 4 on the turnpike.

Dedicated Truck Lanes

The feasibility of creating dedicated truck lanes on the Massachusetts Turnpike and other state roads should be explored. The American Road and Transportation Builders Association supports toll-financed truck-only lanes.

Improved Access to Intermodal Facilities; Roll-on/Roll-off Shipping

There is a need for improved access to intermodal facilities, especially in the older, more densely developed areas where residential roadways must sometimes be used and/or where there is no direct rail access. Improved access would reduce shipping time, which, in turn would reduce costs.

It would be advantageous, particularly to independent truckers, for roll-on/roll-off shipping to be available in the MPO region.

In roll-on/roll-off shipping, goods carried via barge are in a trailer or container that is on a chassis with wheels and tires. The truck driver hooks his cab or tractor onto the chassis and drives it on or off the barge. The Port of Fall River (outside the MPO region) has roll-on/roll-off shipping.

FIGURE 2
U.S. Domestic Truck Freight Traffic
Year 2000

Source: Reebie Associates TRANSEARCH and U.S. DOT Freight Analysis Framework Project

FIGURE 3
FHWA Scheme F Vehicle Classification

1 Motorcycles

2 Passenger Cars

3 Other Two-Axle, Four-Tire, Single-Unit Vehicles

4 Buses

5 Two-Axle, Six-Tire, Single-Unit Trucks

6 Three-Axle, Single-Unit Trucks

7 Four-or-More-Axle, Single-Unit Trucks

8 Four-or-Less-Axle, Single-Trailer Trucks

9 Five-Axle, Single-Trailer Trucks

10 Six-or-More-Axle, Single-Trailer Trucks

11 Five-or-Less-Axle, Multi-Trailer Trucks

12 Six-Axle, Multi-Trailer Trucks

13 Seven-or-More-Axle, Multi-Trailer Trucks

FIGURE 4
Boston Region MPO Area: Municipalities and Regional Transportation Corridors

FIGURE 5
Major Highways in Massachusetts

FIGURE 6
Functional Classification of Major Roads in Massachusetts

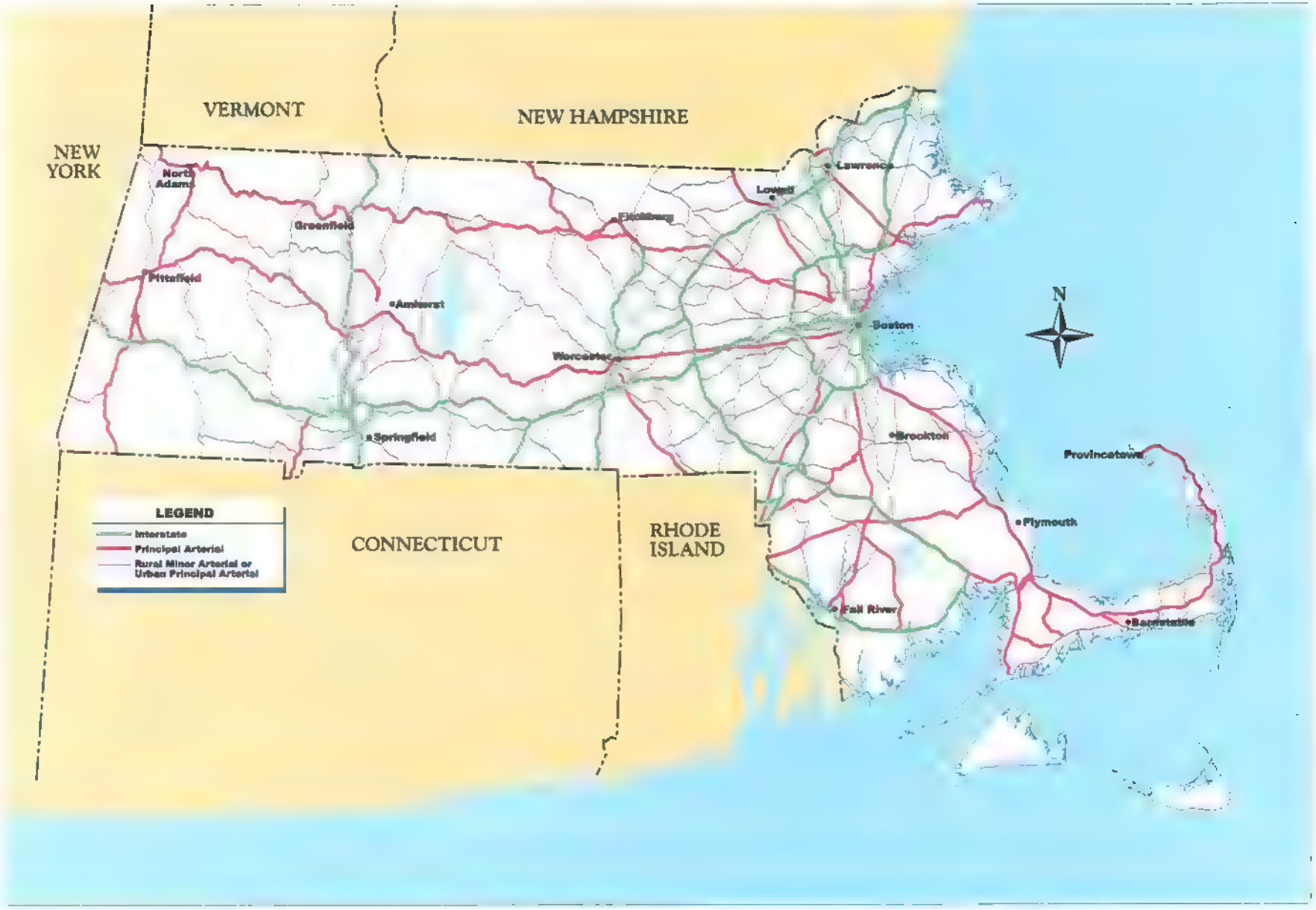


FIGURE 7
National Highway System Routes

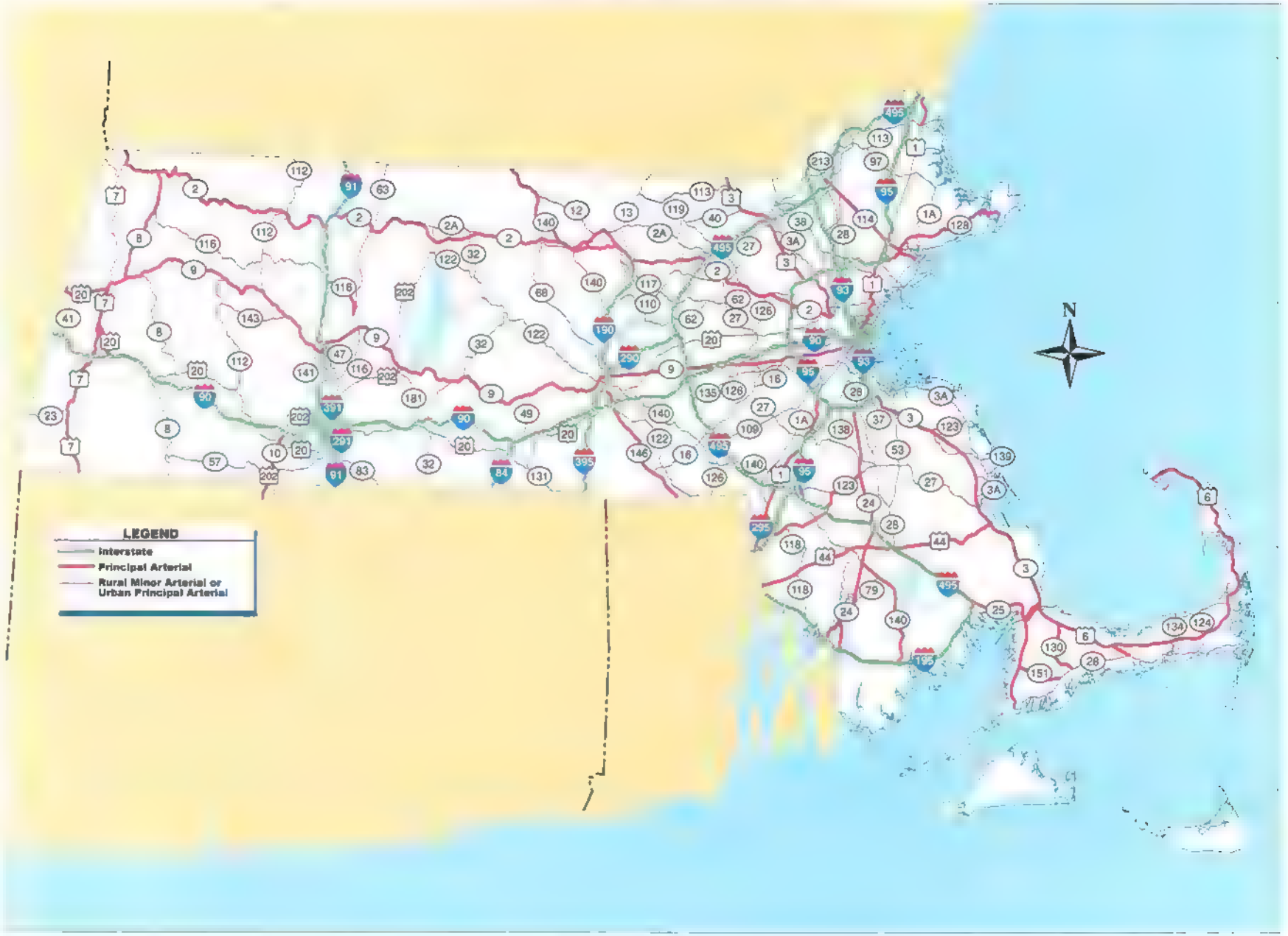


FIGURE 8
Roadways with Posted Bridges

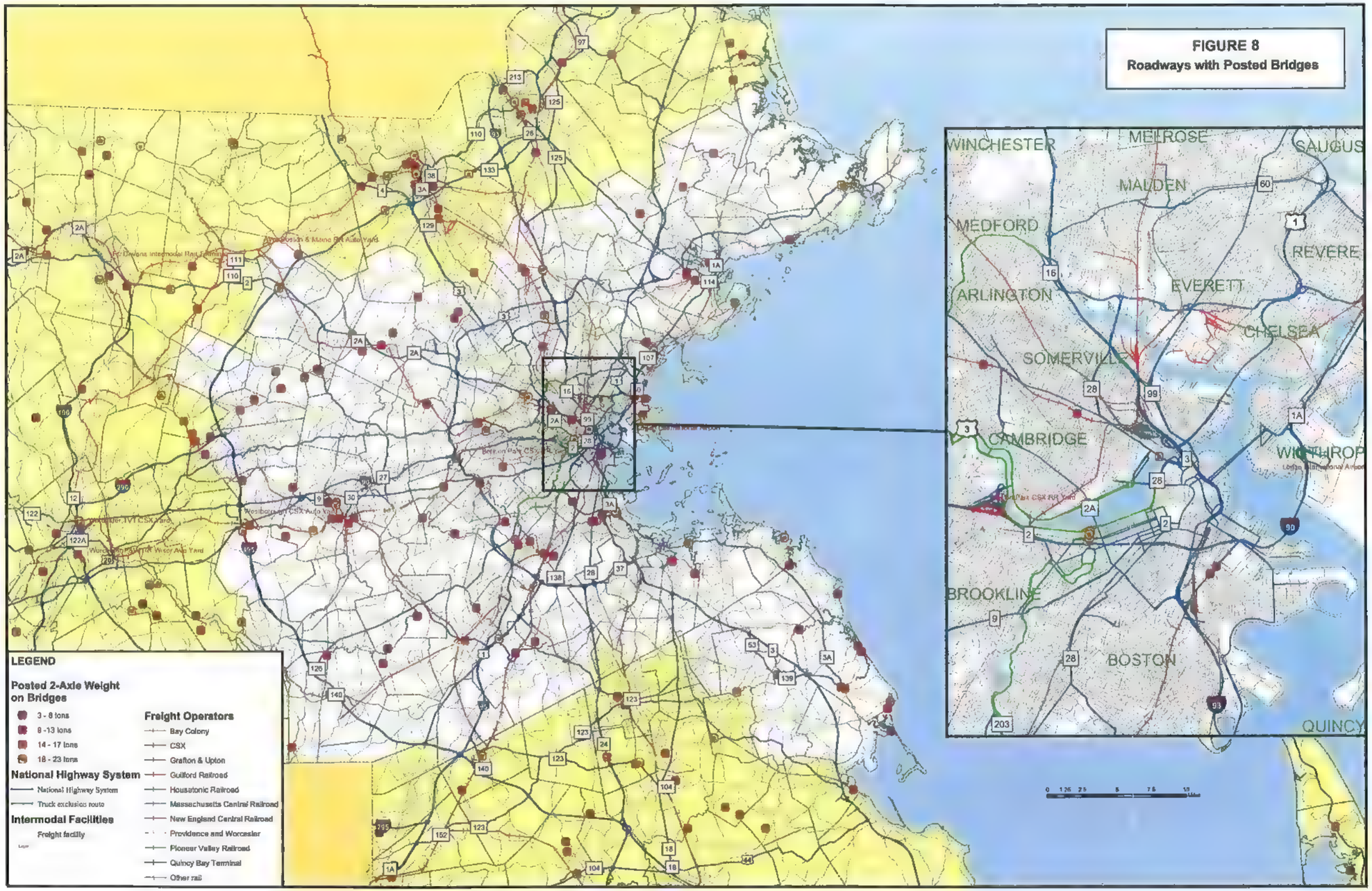
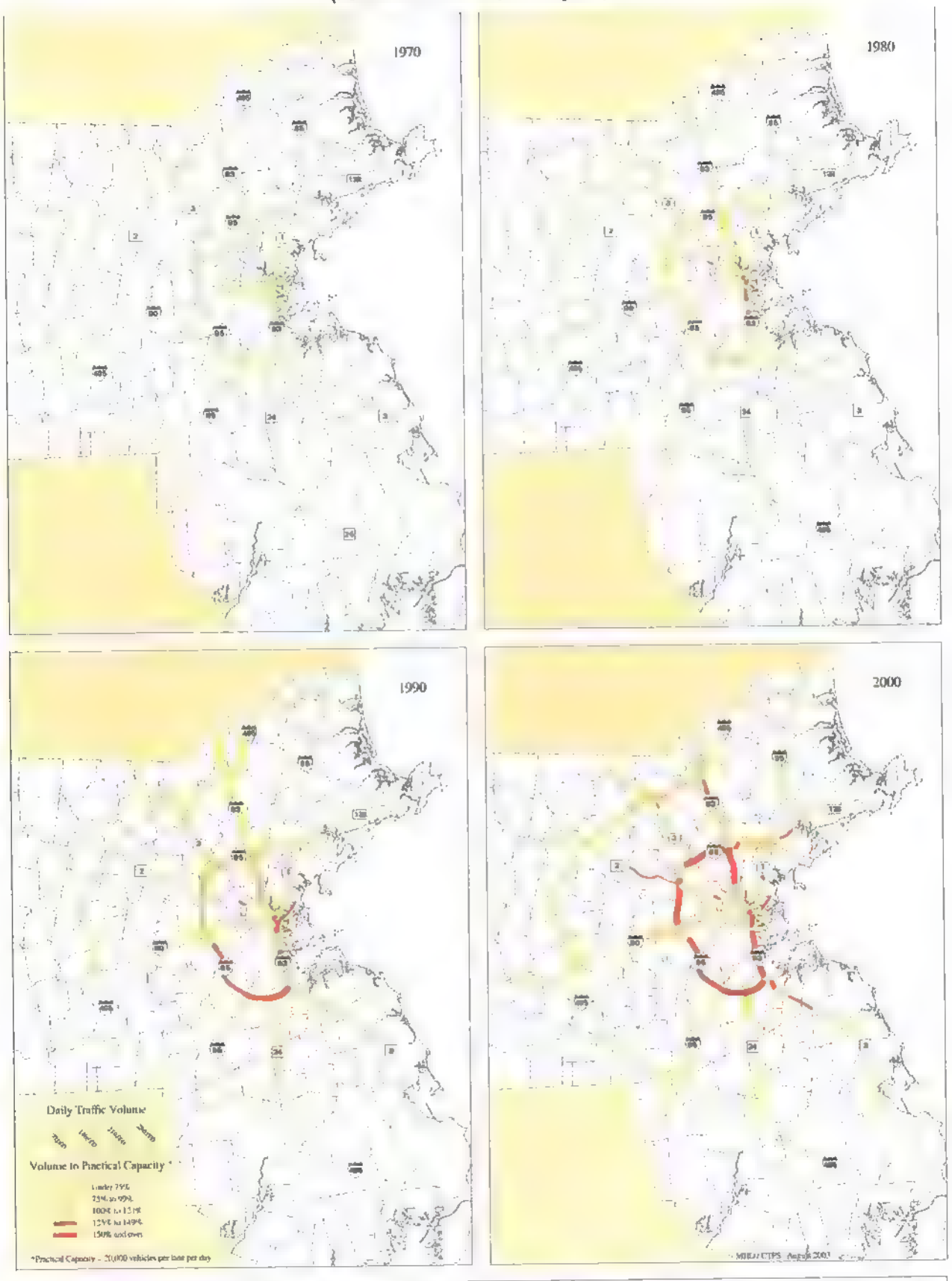


FIGURE 10

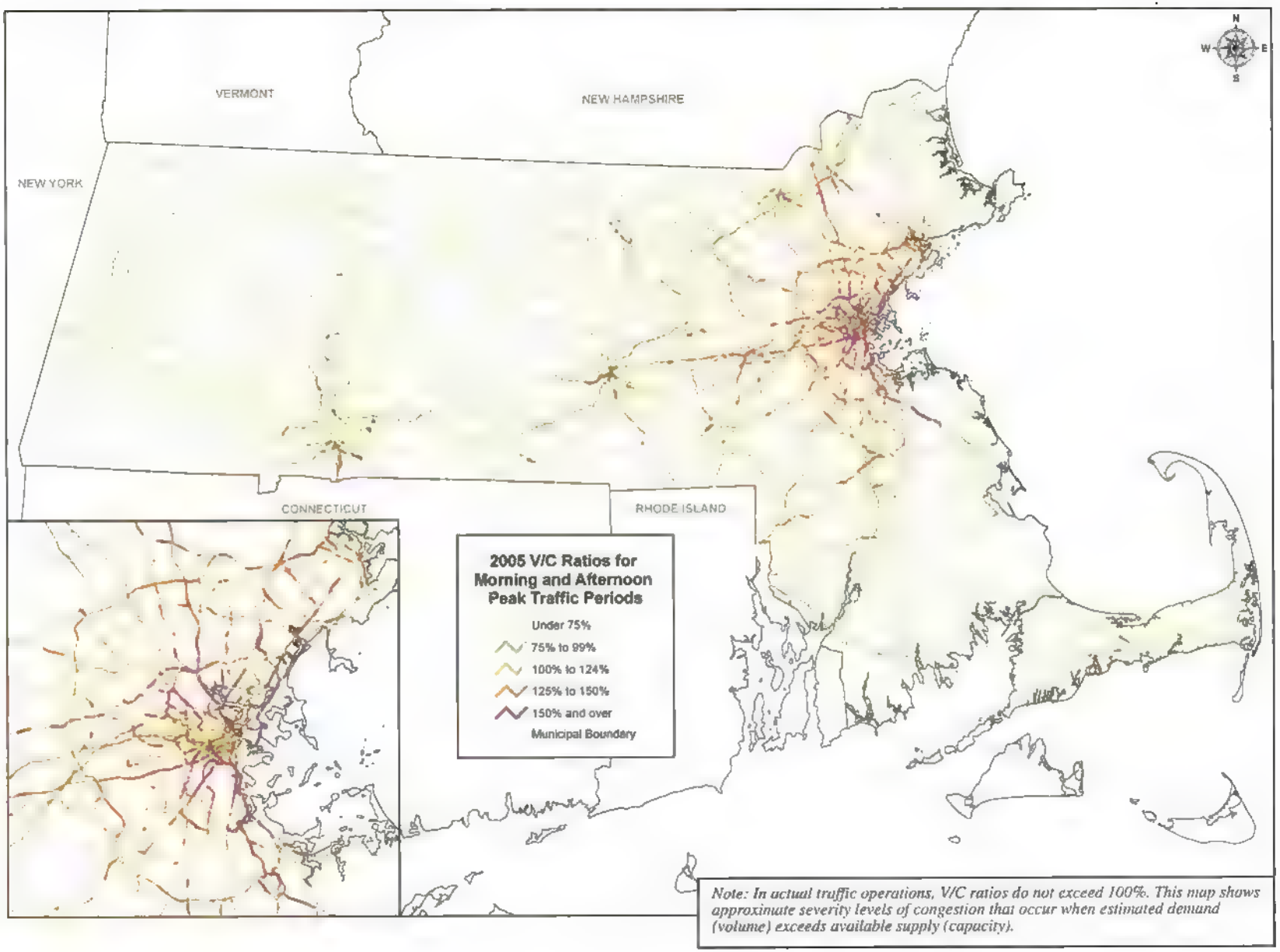
Volume-to-Capacity Ratios and Daily Traffic Volumes on Boston Area Expressways, 1970 to 2000

(For 2005 V/C ratios, see Figure)



Note: In actual traffic operations, V/C ratios do not exceed 100%. These maps show approximate severity levels of congestion that occur when estimated demand (volume) exceeds available supply (capacity).

FIGURE 11
2005 Estimated Volume-to-Capacity Ratios on Major Roads in Massachusetts
(For 1970-2000 V/C ratios, see Figure)



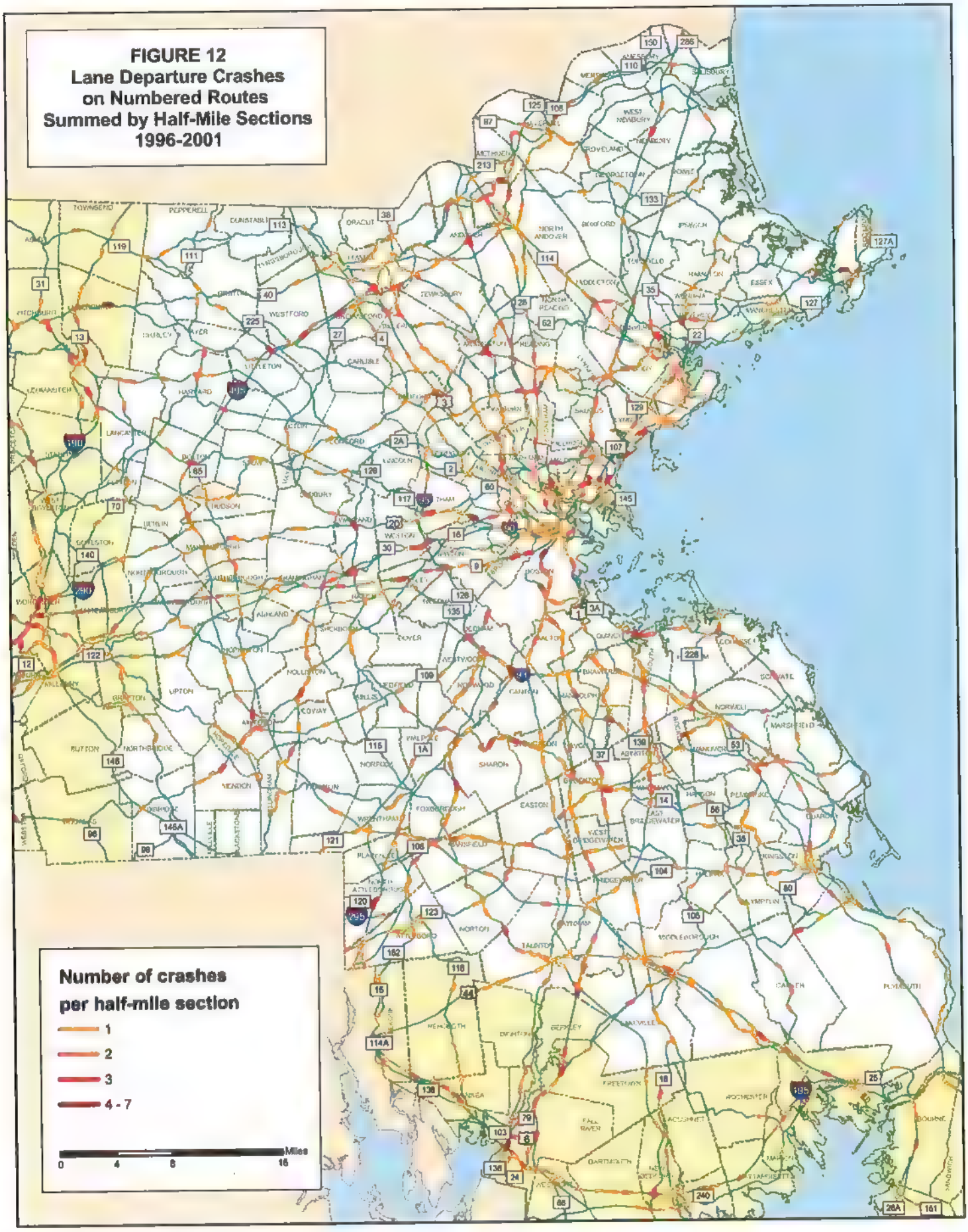
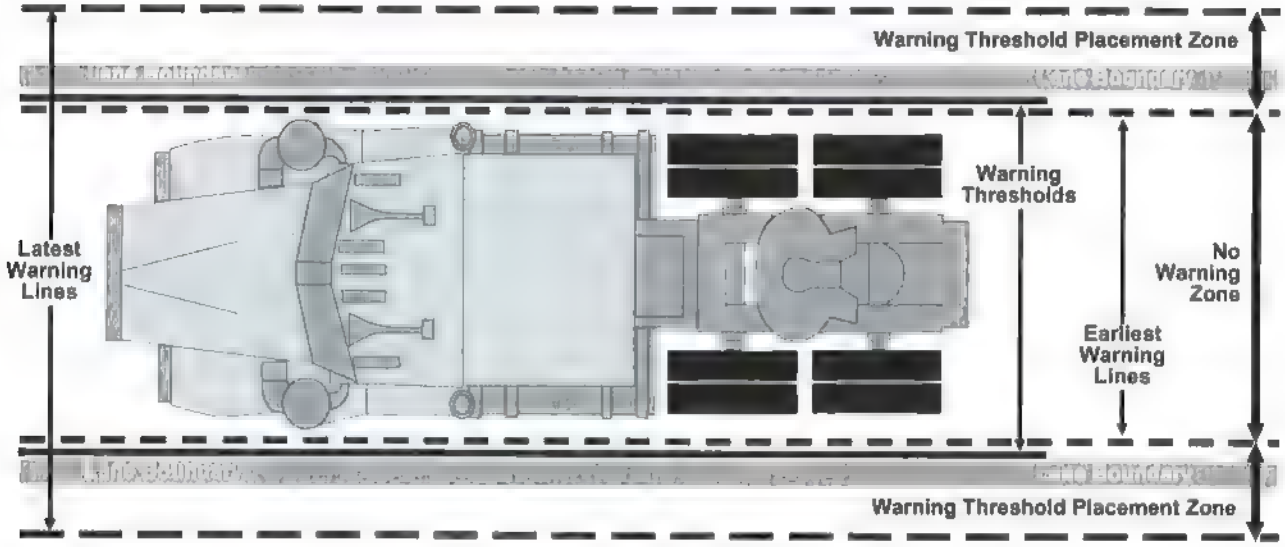


FIGURE 12
Lane Departure Crashes
on Numbered Routes
Summed by Half-Mile Sections
1996-2001
Number of crashes
per half-mile section
1
2
3
4 - 7
0
4
8
16
Miles

FIGURE 13
LDWS* Warning Thresholds and Warning Threshold Placement Zones
*Lane-Departure Warning System



4 Maritime Freight

The three sections of this chapter address port facilities (including cargo handled), port logistics, and issues perceived by stakeholders and possibly within the purview of the MPO.

PORT FACILITIES

Overview

Massachusetts has nine commercial ports for the import and export of freight. Three of these are located in the MPO area: the Ports of Boston, Salem, and Gloucester. The six other commercial ports are located in Fall River, Fairhaven/New Bedford, Woods Hole, Vineyard Haven, Hyannis, and Nantucket. See Figure 14. (In this report, each chapter's *full-page* figures and tables are at the end of the chapter.)

The Port of Quincy, also shown in the figure, is for the exclusive use of its owner, the Massachusetts Water Resources Authority. It is not a common-user facility like Conley Terminal. A common-user facility is a publicly operated commercial port or terminal that may be used by multiple shipping lines or users upon payment of a tariff or user fee to the operator.

The Port of Boston *(owned and operated by the Massport)*

Figure 15 depicts the Port of Boston and briefly describes the Port's major components.

History

The Port of Boston is the oldest continually active major port in the Western Hemisphere. It became an international cargo port in 1630 and remains today the commonwealth's major gateway for international shipping. The Port was transformed beginning in 1956 when the locally controlled port commission was replaced by the autonomous, self-supported Massachusetts Port Authority (Massport). At that time Massport began buying up and rehabilitating abandoned and deteriorating property, updating rail and road links, and preparing the port for changes in the world shipping industry.

A very important change came about when Sea-Land, a private ocean carrier, pioneered the use of shipping "containers" in the trans-Atlantic trade. Shipping containers are standardized 20- or 40-foot-long boxes that can be mounted on a truck chassis or stacked up to eight high in the holds of ships. Massport's Castle Island Container Terminal, one of the first container terminals in the country, was constructed and leased to Sea-Land.

In 1971, a second container terminal was built by Massport in Charlestown as a common-user facility. A common-user facility is typically owned by a governmental entity and operated on a for-hire, for-fee basis, similarly to the way a common carrier operates, for the benefit of the general public. In 1980, Sea-Land gave up its lease at Castle Island, and Massport built a new, larger, common-user facility on the site. That facility became Conley Terminal.

Cargo at the Port of Boston

The Port of Boston handles annually more than 1.3 million tons of general cargo, 1.5 million tons of non-fuel bulk cargo (salt, gypsum, cement, automobiles), and 12.8 million tons of bulk fuel cargos (petroleum and liquefied natural gas).

The top ten import commodities (by weight) that passed through the Port of Boston from April 2004 through March 2005 were:

Beer & Wine – 17%
Furniture – 10%
Fish & Shellfish – 9%
Footwear – 8%
Toys – 3%
Plastic Products – 3%
General Cargo – 2%
Paper and Paper-Board (including waste) – 2%
Pottery & Ceramics – 2%
Non-Alcoholic Beverages – 2%
(Other – 42%)

The top ten export commodities (by weight) that passed through the Port of Boston during that same period were:

Paper and Paperboard (including waste) – 38%
Mixed Metal Scrap – 7%
Automobiles – 6%
Hides, Skins, Furs – 6%
Fish, Shellfish – 5%
Logs & Lumber – 4%
Household Goods – 3%
General Cargo – 3%
Medical Equipment & Supplies – 2%
Fabrics, Including Raw Cotton – 1%
(Other – 18%)

Terminals and Other Facilities

Conley Terminal

The Paul W. Conley Container Terminal is a 101-acre, multiberth terminal. It has 2,000 feet of berthing space, with 1,100 feet dredged to a depth of 45 feet and 900 feet dredged to a depth of 40 feet. Dredging was completed in Boston Harbor to allow for these depths in the late 1990s. The facility has four post-Panamax-sized (see Port Logistics section, below) gantry cranes (for ships too big to traverse the currently configured Panama Canal) for loading and unloading container vessels. The roadway gates are open Monday through Friday from 7:00 AM, with the last truck allowed in for pickup at 4:15 PM. Ships can dock seven days a week, 24 hours a day.

All cargo is unloaded onto trucks, which take First Street, L Street/Summer Street, D Street, and Congress Street to access a dedicated road, the South Boston Haul Road, on which they can proceed to Interstate 93 and Interstate 90. Over 80 trucking firms offer ocean-container trucking through the Port of Boston. These firms are part of the average 900 to 1,000 daily truck moves in and out of Conley Terminal.

Currently there is no rail service directly into or out of Conley Terminal. For rail connections, trucks take the haul road to Interstate 90 and proceed to rail transfer facilities such as the one at Beacon Park Yards in Allston, four miles from Conley Terminal. Freight moved to Beacon Park Yards by truck costs approximately $125 to $150 per container.

Massport is investing $25 million in Conley Terminal to increase its capacity. Officials expect to attain 50%-higher capacity by accommodating higher and wider stacks of containers. Currently the stacks are three high; the improvements will allow for stacks that are five high.

Moran Terminal

In 1998, Moran Terminal and Mystic Pier One in Charlestown were converted and leased to the Boston Auto Port. The facility, 65 acres in size, is used for the importing and processing of automobiles. Currently the automobiles are transported by truck auto-carriers that access the terminal along Medford Street to Sullivan Square or along Medford Street to Chelsea Street to City Square.

Moran Terminal has the potential for rail service over the Mystic Wharf Branch, a 1.45-mile track in Charlestown. Massport purchased this rail line from Boston and Maine/Pan Am Railways (formerly Guilford Rail System) in 2002 to preserve rail access to the port. However, in June 2005, the Surface Transportation Board (STB) granted a Discontinuation of Service Exemption to Pan Am Railways, allowing it to discontinue service over this branch. Pan Am was not granted the authority to abandon its obligations under the exemption. This branch should be considered "inactive" rather than "abandoned."

Recently, Massport completed a feasibility study for rail access and a truck haul road along the Mystic Wharf Branch corridor. A report on the study, entitled *Charlestown Haul Road/Rail Corridor Feasibility Study*, was prepared for Massport by Rizzo Associates and published in July 2005. Massport has a strong interest in improving existing access and preserving future access to this area for both rail and truck. If Massport were to move forward with a haul road/rail corridor concept, a number of additional steps would be required before a preferred alternative could be selected and designed. It would also have to coordinate with potential plans for highway improvements for Rutherford Avenue and Sullivan Square, along with acquiring the federal, state, and local permits required to proceed.

Massport Marine Terminal/North Jetty

The Massport Marine Terminal is located on the waterfront in the Marine Industrial Park in South Boston (site of the former South Boston Army Base). The site offers 800 feet of berthing space at a 40-foot depth on the North Jetty. Approximately 10 acres of the site is dedicated to modern seafood processing or related facilities that support the fishing industry.

The Central Artery/Tunnel (CA/T) Project used most of the remaining 30 acres for construction staging. With the completion of the CA/T project, Massport recently awarded the bid for the development of the North Jetty area. The redevelopment will allow for the handling of bulk and conventional cargo and for refrigerated warehousing. Specifically, the plan is to create a trans-load facility that can handle seafood, cement, and break-bulk (non-containerized and piece-handled cargo) and that includes a fumigation facility (using ethyl bromide) for flowers and lumber. Currently, the nearest fumigation facility is at the Port of New York, which is where most flowers and lumber are now transported.

This site has access via designated truck routes and the interstate highway system. There is also a potential rail connection. There are two overweight-truck routes: trucks of up to 99,000 pounds are allowed along Drydock Avenue to the Fargo Street Extension to E Street to Summer Street and onto the Haul Road, then either to Route 1A to Route 128 to Gloucester or to Interstate 93 to Route 24 to New Bedford. These routes were designated primarily for the use of the seafood business.

The area's potential rail connection is over the Boston Terminal Running Track, also known as Track 61. This track was temporarily taken out of service during the CA/T construction but will be restored as part of the project's restoration of the area. The company that has been awarded the bid for the North Jetty development hopes that Massport will construct the piece of rail line needed to access the water's edge just south of the Ted Williams Tunnel.

East Boston

The East Boston Shipyard and Marina on Marginal Street is the only ship repair facility in Boston Harbor equipped to serve midsized commercial vessels.

Charlestown

- *Mystic Piers*
  The Mystic Piers are a waterfront terminal 3.5 acres in size located just east of the Tobin Bridge. The terminal, consisting of three berths totaling 2,053 feet in length, primarily serves break bulk cargo. At this time, the site is used to import, store, and distribute salt.

- *Medford Street Terminal*
  These 14 acres were bought by Massport to ensure the area would remain available for marine cargo use.

Other Maritime Properties in the MPO Area *(these properties are not owned or operated by Massport)*

South Boston

Boston Fish Pier
Located on Northern Avenue, this is the oldest working fish pier in the country. It serves the commercial fishing industry in the Boston Harbor area.

International Cargo Port
This facility is located on Black Falcon Avenue, adjacent to the Black Falcon Cruise Terminal, in the Boston Marine Industrial Park (BMIP) in South Boston. It houses various companies and organizations involved in international trade and commerce, including the U.S. Customs Document Analysis Unit.

Fargo Street Terminal
This facility consists of 15 acres of flat paved land and has been used for various maritime-based industrial purposes, such as vehicle storage and similar activities, in support of operations at Conley Terminal and the Black Falcon Cruise Terminal.

Port of Salem

The Port of Salem is owned and operated by the New England Power Company. It has a deep channel and associated landside industrial facilities, including a coal- and oil-fired power plant and an oil storage facility. The Salem Terminal Wharf is operated by the New England Power Company and has one 800-foot berth. The facilities are served by 35-foot-draft tankers and 38-foot-draft coal ships. More than one million tons of coal and three million barrels of oil are delivered annually. The wharf has a storage capacity of 100,000 tons bulk and one million barrels of oil.

Landside access to the port is by truck, with Route 128/Interstate 95 three miles away. Existing rail is one mile from the port. Future plans at the port include expansion of the existing ship basin and construction of a second 600-foot pier and cruise terminal.

Port of Gloucester

The Port of Gloucester is owned by the Commonwealth of Massachusetts and operated by Elliot Shipping, Inc. It is an import/export point for Canadian and European ports of call. It has a direct connection to Route 128/Interstate 95 and is located one mile from a rail siding. Gloucester has developed into a major import center for frozen seafood products and currently maintains the largest cold storage port facilities of any U.S. port. Gloucester also offers a new container-handling facility and a variety of vessel services.

The port concentrates on providing service for small vessel owners. The harbor has two 300-foot vessel berths, one 600-foot berth, and one 800-foot berth. A depth of 20-24 feet is available at low tide, and vessels of up to 300 feet can be accommodated. Ship cargoes are loaded and discharged seven days a week, 24 hours a day.

Efforts are underway to revitalize the use of Gloucester's seaport and harbor and diversify importing and exporting. Funds are being allocated for dredging the harbor to 26 feet and renovating the Gloucester State Pier to increase the number of berths and expand the harbor's capabilities.

Major Ports Outside of the Boston Region MPO Area

Port of Fall River

The Port of Fall River is owned by the City of Fall River and the Commonwealth of Massachusetts and is operated by Fall River Line Pier, Inc. The second-busiest commercial port in Massachusetts, after the Port of Boston, it is located on the Taunton River, approximately 17 miles northeast of where the river meets the Atlantic Ocean. It is a 10-acre facility with two deep-water berths and a 96,000-square-foot storage terminal. The port specializes in break-bulk cargoes and handles linerboard, lumber, paper products, frozen fish, and chemicals.

The facility includes a roll-on/roll-off ramp for loading and unloading loaded containers mounted on tractor-trailer chassis from ships. Rail connections to the port include three rail spurs that run the length of the terminal and connect to a line in Taunton. The line and rail spurs, both part of the CSX system, allow freight to travel from the port to all of southern New England and to inland points.

Connections to major highways are made through an Interstate 195 interchange that is less than one mile from the port. This connects to Massachusetts State Route 24, less than three miles away, and then to Interstate 95, approximately 17 miles away.

Port of New Bedford

The Port of New Bedford is owned by the City of New Bedford and the Commonwealth of Massachusetts and operated by the New Bedford Harbor Development Commission (HDC) through Maritime International, Inc. It is located on the Acushnet River

approximately three miles north of Buzzards Bay. Since the early 1960s, it has been one of the area's largest handlers of perishable goods, including fruit, vegetables, and bulk commodities of frozen fish and meat products. It has various vessel berths and is able to accommodate the largest refrigerated vessels afloat. The main cargo facility is the 6.5-acre State Pier, with approximately 140,000 square feet of enclosed storage space.

The Port of New Bedford has roadway connections linking up to Interstate 195. The north side of the harbor is being dredged and was classified as a superfund site by EPA. A mechanism for transporting the dredged material was needed, so a rail siding (or spur) was built; it was constructed in such a way that it can be used in the future as part of a more permanent facility.

PORT LOGISTICS

Primary Shipping Routes

There are two major ocean routes for the delivery of freight by ship to the East Coast of the United States, one from Europe and the other from Asia. The European route is long established. Although it is faster (generally by one day) to ship into Boston than into the Port of New York/New Jersey or the Port of Norfolk, Virginia, most of the freight goes through the latter ports. The Port of New York/New Jersey gets the most business because it can offer five to six different intermodal services for delivery throughout the United States.

The Port of Boston has no direct rail service. It is indirectly served by rail service provided by CSX at Beacon Park Yards in Allston and the Port of Worcester. Rail service is also available in Ayer, Massachusetts, provided by Pan Am Railways (formerly Guilford Rail System). Double-stack rail into the Port is not a priority at this time. Currently, the Port of Boston is not losing business due to the lack of double-stack rail. Massport would first like to have single-stack rail service to the Port area. Business into the Port would have to increase before double-stack would become a major issue. Massport would like to see the condition of the bridges along the rail lines assessed. This assessment would determine how many of these bridges would allow double-stack trains, what repairs would be necessary in order to allow double-stack trains, the costs of those repairs, and the feasibility of establishing regular rail freight service into the Port.

Trucks do not have direct access from the Port of Boston to a haul road or to the expressway system. They use designated truck routes to access the haul road, which links to expressways.

Recently, Massport completed a feasibility study for rail access and a truck haul road along the Mystic Wharf Branch corridor. *Charlestown Haul Road/Rail Corridor Feasibility Study*, prepared for Massport by Rizzo Associates and published in July 2005, reports on the study. Massport has a strong interest in improving existing access and preserving future access to this area for both rail and truck. If Massport were to move

forward with a haul road/rail corridor concept, a number of additional steps would be required before a preferred alternative could be selected and designed. Massport would also have to coordinate with potential plans for highway improvements for Rutherford Avenue and Sullivan Square, along with acquiring the federal, state, and local permits required to proceed.

Service from Asia generally goes through the Panama Canal and would arrive in the Port of New York/New Jersey before Boston. Therefore, the Port of New York/New Jersey receives the majority of the business from Asia, with the remainder coming primarily to the Port of Boston.

Requirements of Larger Ships

Shipping agents are beginning to build larger ships for transporting international freight. This will change the shipping business along the East Coast. The new ships are called Post-Panamax ships, because they are too large to pass through the Panama Canal.

The newer ships can hold more containers. Most containers are either 20 or 40 feet long, so the term TEU or twenty-foot equivalent unit is used to determine the capacity of a ship. Most ships now carry about 4,000 to 5,000 TEU. The Post-Panamax ships are being built to handle 8,000 to 10,000 TEU. They cost more to build, but once built, the labor and operations costs are the same. From the shipper's perspective, once the initial construction costs are borne, more freight can be carried at the same cost.

The Post-Panamax ships are presenting a challenge to the ports. The ports must have larger cranes to unload and load the ships: the ships not longer but are wider, so that cranes must reach further across. Deeper channels are also required to accommodate the ships, and more labor to load and unload the freight. The West Coast ports are beginning to be overwhelmed by these ships. They are creating bottlenecks at the ports: their demands are also greater in terms of berth time and trucks to transport the freight. It takes approximately 3 years to build one of these bigger ships; however, it takes from 5 to 10 years to change port conditions to be able to handle them. These ships will begin arriving at the East Coast ports sometime between 2007 and 2011.

The Port of New York/New Jersey is currently dredging its channels to a 45-foot depth and once that is completed hopes to dredge to 50 feet to accommodate the larger ships. These ships can probably get by with the 45-foot depth, but a 50-foot depth would serve them better. The dredging to 50 feet is at least three to four years away. New York/New Jersey is investing in the required larger cranes but will have the same amount of labor and land to store the freight.

As the larger East Coast ports become ready for them, the Post-Panamax ships will begin using these ports. If the same bottlenecks occur at such East Coast ports as are currently occurring on the West Coast, the shippers with smaller ships will most likely begin calling on the other East Coast ports. In this case, unless Boston has at such a point in time readied itself for and begun receiving the Post-Panamax ships, its shipping business

will probably increase, with the ships that are being displaced (4,000 to 5,000 TEU) using it. Mediterranean ports are one of the origins from which more ships may come into Boston under this scenario.

Nevertheless, one of the most important issues for the Port of Boston is dredging its channels deeper. The channel into the Port is currently dredged to 35 to 40 feet at low tide, with 45 feet at the berth. This dredging was completed in the late 1990s. Currently, Massport has a permit request in to the Army Corps of Engineers to dredge the channel to 45 feet. It will probably take until about the year 2010 to obtain the necessary permits and funding for this additional dredging.

The Ports of New Bedford and Gloucester both also have dredging in their future plans. The channel in New Bedford is currently dredged to a depth of 28 feet, the channel in Gloucester to 24 feet.

"Float Bridges" and Roll-On/Roll-Off

New England Transrail (NET), a Teaneck, New Jersey, limited liability corporation doing business in the Boston Region MPO area as the Wilmington and Woburn Terminal Railroad Company (see Endnote 3) is planning to operate "float bridges" (ferry for rail) out of the Newark area. Norfolk Southern and CSX operate out of Elizabeth, New Jersey. Goods that would be moved include dense, low-value items that are not time sensitive. The bulk freight that is moved by these railroads includes steel, chloride, road salt, paper, corn syrup, and soda ash.

The Port of Newark, New Jersey, is building a roll-on/roll-off terminal facility. In roll-on/roll-off shipping, goods carried via barge are in a trailer or container that is on a chassis with wheels and tires. The truck driver hooks his cab or tractor onto the chassis and drives it on or off the barge. The Port of Newark will send the barges north via the Atlantic Ocean, an example of short-sea shipping or coastal barging, for eventual delivery to New England via either a facility in Quonset Point or Providence, Rhode Island, or New Bedford, Massachusetts, none of which are in the MPO area.

The Seaport Bond Bill

The Seaport Bond Bill is an approximately $300 million authorization bill passed in 1996 by the Commonwealth and managed by the Executive Office of Environmental Affairs. This bill authorizes approximately $100 million in funding for improvements in each of three different areas: dredging, coastal improvements, and rail. To date, about $60 million has been spent on various port improvement projects, including ones performed to support the fishing industry. Since Massport has its own bonding capacity and maintains the Port of Boston, the funding through this bond bill has primarily gone to development and improvement work at the other ports in Massachusetts. Funding for the *Charlestown Haul Road/Rail Corridor Feasibility Study* was, however, provided through the Seaport Bond Bill.

ISSUES PERCEIVED BY MARITIME-FREIGHT STAKEHOLDERS AND POSSIBLY IN THE MPO'S PURVIEW

The following descriptions of issues perceived by stakeholders and possibly in the MPO's purview are based on interviews with individuals affiliated with owners and operators of freight transportation facilities and services and with users of freight transportation. Issues perceived by stakeholders but outside the MPO's purview are listed in chapter 8. The following are descriptions of the views of the individuals interviewed (all interviewees for this study are listed in Appendix 1). Some related data are also provided where deemed useful.

"The Last Mile" of Roadway Access

The Ports of Boston, Salem, and Gloucester suffer from difficulty in getting freight from the docks to their local highway system over "the last mile," which in most cases consists of local or residential streets. Access to the highways from the Port of Boston has improved with the opening of the Central Artery/Ted Williams Tunnel, but it could be further improved. Although two separate overweight-truck routes have been designated, mostly to accommodate the seafood business, there is a need for additional overweight-truck routes in the area.

Rail Service to Port Facilities

Currently there is no rail freight service to the Port of Boston, though railroad tracks exist. "Track 61," directly linked to the Port area, is temporarily out of service due to Central Artery construction. This track will be restored as part of the completion of Artery construction. Representatives of the company awarded the bid for the North Jetty development hope that a rail spur will be constructed from the existing Track 61 to the water's edge for transport of freight.

Massport is conducting informal talks regarding an alternative rail bridge across the Reserve Channel to access Conley Terminal. Coastal Properties and the MBTA own property along First Street in South Boston, which runs to the southwest of Conley Terminal. Depending on the siting of any proposed rail bridge, this property could be affected by having all or a portion of the bridge and/or any of its access roads constructed on it.

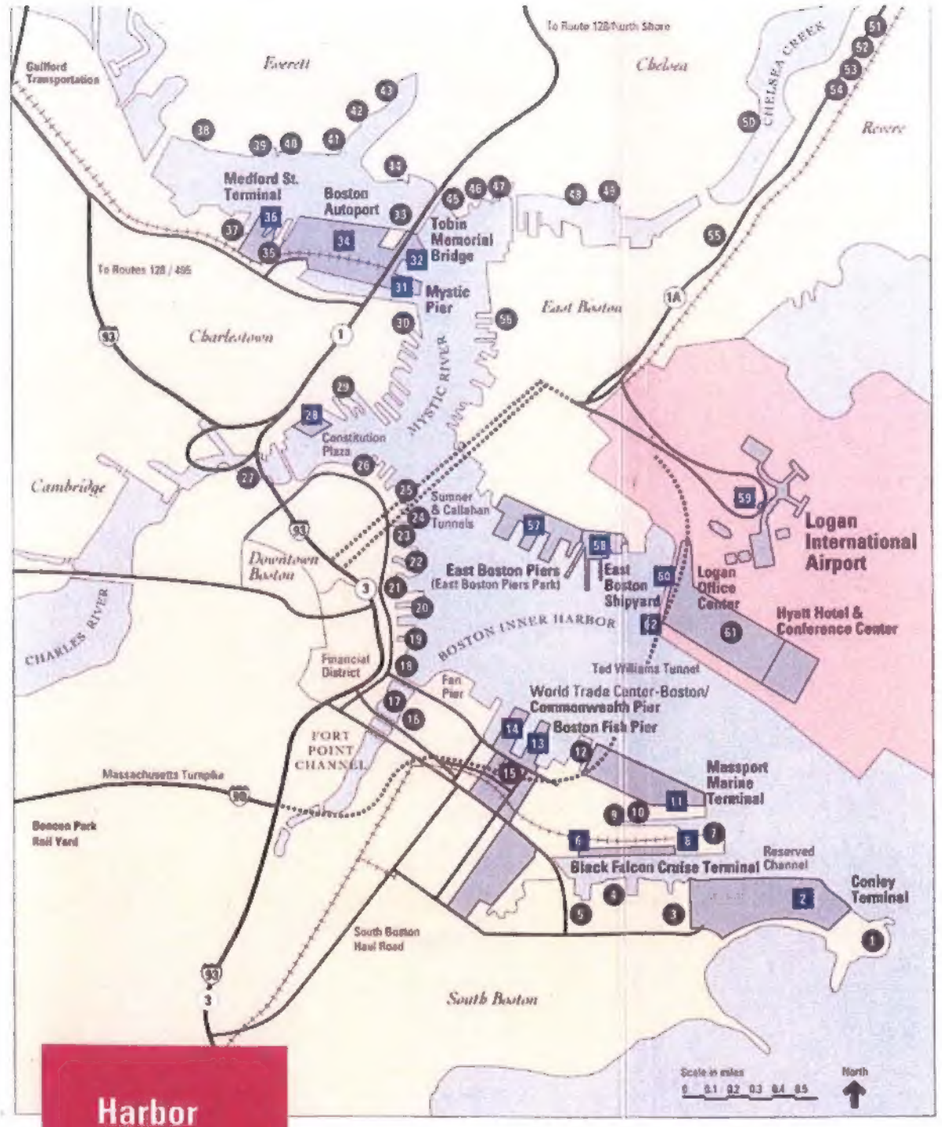
Generally speaking, freight rail access to the Port would be either: (1) from the west, on the CSX mainline in Framingham, along the Massachusetts Turnpike, under the Prudential Tunnel through South Station and into the Port; or (2) from the CSX mainline in Framingham, southeast to Walpole, then north through Readville. Prohibition of the transport of hazardous materials through a tunnel structure would restrict some freight use of the Prudential Tunnel route.

Dredging

The channel into the Port of Boston is currently dredged to a depth of 40 feet but needs to be at least 45 feet deep in order to accommodate ships of deeper draft, such as those currently servicing the Ports of New York and New Jersey. Massport is pursuing a permit for this dredging.

FIGURE 14
Massachusetts Seaports

FIGURE 15
Port of Boston



Harbor Reference Guide

■ Massport Properties
● Non-Massport Properties

Source: Massachusetts Port Authority

South Boston Waterfront

1 **Fort Independence**, at Castle Island, is the eighth fort built at this site since 1634 to protect Boston Harbor.

2 **Conley Terminal** is a 101-acre container terminal equipped with four post-Panamax cranes, and 4,450 feet of berthing including 1,050 feet at 45 feet deep and 900 feet at 40 feet deep. It is the first port of call inbound and last port outbound for vessels serving the North Atlantic and handles over 150,000 TEUs annually with the capacity to expand to meet New England's future cargo needs.

3 **Coastal Oil South Boston**

4 **MBTA Power Plant and Cardinal Medeiros Lobster Terminal**

5 **Sithe New England Power Plant**

6 **The Black Falcon Cruise Terminal** handles more than 100,000 passengers and 80 ocean-going cruise vessels annually.

7 **Coastal Cement Terminal**

8 **International Cargo Port** a state-of-the-art intermodal freight distribution facility. The adjacent 35-foot-deep berths provide docking for deep-draft vessels.

9 **Boston Marine Industrial Park** is the location of numerous businesses such as seafood processing, warehousing, and ship repair as well as the Boston Design Center.

10 **Drydock #3** is one of the largest on the East Coast, 1200 feet long and over 40 feet deep. Has handled such vessels as the QEII, USS Massachusetts, and other commercial and military ships.

11 **North Jetty/Massport Marine Terminal** is currently used as a staging area for the Central Artery Project. The 900-foot berth is 40 feet deep and is also used for seafood processing, and break bulk and dry bulk cargo.

12 **South Boston Drydock #4**

13 **Boston Fish Pier**, the oldest working fish pier in the U.S., opened in 1914. Massport has invested over $30 million to modernize the pier. Also located here is the Exchange Conference Center, a state-of-the-art meeting and conference space.

14 **World Trade Center Boston**, formerly Commonwealth Pier Number 5, has been redeveloped to provide one million square feet of office and exhibition space, a conference center, and docking facilities.

15 **Seaport Hotel**, with 427 rooms, exhibition space, and meeting facilities.

16 **Museum Wharf** (Children's Museum, Computer Museum)

Downtown Waterfront

17 **Boston Tea Party Ship and Museum**

18 **Rowes Wharf/Boston Harbor Hotel** (Airport Water Shuttle and commuter boats)

19 **India Wharf** (Harbor Towers)

20 **Central Wharf** (New England Aquarium)

21 **Long Wharf/Marriott Long Wharf** (Harbor Express and Boston Harbor Cruises)

22 **Commercial Wharf** (residential)

23 **Lewis Wharf** (residential)

24 **Lincoln Wharf** (residential)

25 **Battery (Constitution) Wharf** (commercial)

26 **U.S. Coast Guard Support Center**

Charlestown Waterfront

27 **Paul Revere Park** (MDC)

28 **Constitution Plaza and Constitution Marina** (formerly Hoosac Pier) is an office, restaurant and marina facility developed by Massport with public access to the waterfront.

29 **USS Constitution and National Park**

30 **Charlestown Navy Yard** (residential and commercial)

31 **Mystic Pier #1** features 256,000 square feet of covered space for the processing and storage of automobiles at Boston Autoport.

32 **Mystic Pier #48 Salt Terminal**

33 **U.S. Gypsum**, a wallboard manufacturing plant

34 **Boston Autoport** (Moran Terminal), international vehicle distribution center with on-dock rail and highway access and 40-foot-deep berth.

35 **Blue Circle Cement Terminal**

36 **Medford Street Terminal** is an 18-acre deep-water facility appropriate for handling non-containerized cargo.

37 **Charlestown Marine Park**

Everett Waterfront

38 **Sithe New England Power Plant**

39 **Prolerized New England Scrap Terminal**

40 **Distrigas Liquified Natural Gas Terminal**

41 **Exxon Oil Terminal**

42 **Independent Cement Corporation Terminal**

43 **Coldwater Seafood Terminal**

Chelsea Waterfront

44 **Admiral's Hill Condominiums/Marina** (residential)

45 **Atlantic Fuels**

46 **Fitzgerald Ship Repair**

47 **Eastern Minerals Terminal**

48 **Coastal Oil New England, Inc.**

49 **Walton Pier (inactive)**

50 **Gulf Oil Terminal**

Revere Waterfront

51 **Coastal Oil Terminal**

52 **Northeast Petroleum Terminal** (inactive)

53 **BP Oil Terminal**

54 **Global Petroleum Terminal**

East Boston Waterfront

55 **Mobil Oil Terminal**

56 **Boston Towing & Transportation/North Terminal**

57 **East Boston Piers**, site of **Piers Park**, a public open space on the waterfront with picnic and recreation areas. Pier #1 consists of berthing, office, and storage space.

58 **East Boston Shipyard** multi-use marine facility featuring break bulk cargo operations, industrial and commercial moorage and boat building

59 **Logan International Airport**, 17th busiest airport in the U.S., handles 25 million passengers and 800 million pounds of cargo. Logan is currently undergoing a $1.6 billion renovation program to update terminals, improve traffic circulation, centralize parking and add a 50,000 square foot cargo facility.

60 **Logan Office Center**, located on Bird Island Flats

61 **Hyatt Hotel & Conference Center**

62 **Logan Passenger Water Transportation Terminal** with services to points throughout Boston Harbor